

## ARPEGE MEMORANDUM

**From:** GCO

**Date:** May 18, 2006

**To:** GMAP, COMPAS, GMGEC, GMME, DIR/RE/CRC, Mats Hamrud

**Subject:** New cycle CY31

A new cycle CY31 has been created. This is a common cycle with the ECMWF. The different contributions for this cycle are described in the following pages.

ClearCase label: CY31

Modified libraries: ifs, mpa, mse, odb, surf, trans, trans\_ald, ifsaux, utilities

Contributors:

BOGATCHEV Andrey	Project:ifs CCase branch:mrpe702_CY30T1_none
BOUTELOUP Yves	Project:ifs CCase branch:mrpa648_CY30T1_b256
Project:ifs	CCase branch:mrpa648_CY30T1_b262
Project:ifs	CCase branch:mrpa648_CY30T1_b264
Project:ifs	CCase branch:mrpa648_CY30T1_none
Bernard CHAPNIK	Project:ifs CCase branch:mrpa658_CY30T1_narbejb2
Project:ifs	CCase branch:mrpa658_CY30T1_none
DESROZIERS Gerald	Project:ifs CCase branch:mrpm611_CY30T1_bgobs
GCO Project:ifs	CCase branch:marp001_CY30T1_R2
Project:ifs	CCase branch:marp001_CY30T1_none
Project:ifs	CCase branch:marp001_CY30T1_op1
Project:ifs	CCase branch:marp001_CY30T1_t2
HELLO Gwenaelle	Project:ifs CCase branch:mrpe721_CY30T1_none
Project:ifs	CCase branch:mrpe721_CY30T1_nprom_cl
Karim YESSAD	Project:ifs CCase branch:mrpm603_CY30T1_dev30t1pour31
Project:ifs	CCase branch:mrpm603_CY30T1_none
Radmila BROZKOVA	Project:ifs CCase branch:mrpe684_CY30_avacy30
SEITY Yann	Project:ifs CCase branch:mrpm637_CY30T1_bfyann
Project:ifs	CCase branch:mrpm637_CY30T1_none
Project:ifs	CCase branch:mrpm637_CY30T1_yann30t1pourt2
SPANIEL OIida	Project:ifs CCase branch:mrpe693_CY30T1_alfix31

## **BOGATCHEV Andrey**

**Doc:**

**Bugfix.**

**Project:** aladin  
**ClearCase branch:** mrpe702\_CY30T1\_none

*Modified:*

ald/inidata            elsirf.F90

## **BOUTELOUP Yves**

**Doc:**

- *Introduction of the NRCORM key (mass correction frequency) :*  
*NRCORM > 0 : value in time steps*  
*NRCORM < 0 : value in hours*  
*NRCORM = 0 : no correction*
- *Compute the mass correction in dry surface pressure to maintain a global mean . The frequency of the correction is given by NRCORM*
- *Addition of vertical mesospheric drag profile for Q (definitions and setup)*
- *Introduction of mesospheric humidity*
- *Addition of derivative of non solar surface fluxes*
- *Modification of the coupling routines. The logical key NRCPL (coupling frequency) is introduced.*
- *Modification of the nudging routines.*
- *Implementation of sulphate aerosols*
- *Implementation of coefficients for Climate scenari*

**Project:** ifs  
**ClearCase branch:** mrpa648\_CY30T1\_b256

*Added:*

arp/climate	cormass2.F90	updcpl.F90
arp/dia	cumcpldm.F90	
arp/module	SIPC_Attach.F90	SIPC_Init_Model.F90 SIPC_Read_Model.F90
	SIPC_Write_Model.F90	mod_clim.F90 mod_cou.F90
	mod_cpl.F90	mod_inpc.F90 mod_oas.F90
	mod_sipc.F90	yomcom.F90 yomcpl.F90
arp/namelist	namcom.h	namscen.h
arp/ocean	slab.F90	wrcpl.F90
arp/phys_dmn		acdnshf.F90
arp/setup	sucom.F90	sucpl0.F90

*Modified:*

arp/adiab	cpg.F90	cpg_dia.F90	
arp/climate	cormass2.F90	updcldm.F90	updcpl.F90
	updnuddm.F90	updsst.F90	
arp/control	cnt4.F90		
arp/diacpnudg	.F90	cumcpldm.F90	
arp/module	SIPC_Attach.F90	SIPC_Init_Model.F90	SIPC_Read_Model.F90
	SIPC_Write_Model.F90	mod_clim.F90	mod_cou.F90
	mod_cpl.F90	mod_inpc.F90	mod_oas.F90
	mod_sipc.F90	ptrgpd.F90	yomaer15.F90
	yomaer15.F90	yomafn.F90	yomcom.F90
	yomcpl.F90	yomct0.F90	yomgco.F90
	yommcc.F90	yomnud.F90	yomsnu.F90
	yomtoph.F90		
arp/namelist	namafn.h	namcom.h	namct0.h
	nammcc.h	namnud.h	namscen.h
	namtoph.h		
arp/ocean	slab.F90	sugco0dm.F90	wrcom.F90
	wrcpl.F90		
arp/phys_dmn		acdshf.F90	acdrme.F90
	aplpars.F90	aplpars.F90	aplparsadt.F90
	lw15.F90	lwu15.F90	mf_phys.F90
	radaer15.F90	radint15.F90	radlsw15.F90
	rfmr.F90	suaer15.F90	suaerv15.F90
	suecrad15.F90	surdi15.F90	sutoph.F90
	sw15.F90	sw1s15.F90	sw2s15.F90
	swclr15.F90		
arp/setup	suafn1.F90	suafn2.F90	suafn3.F90
	suallo.F90	sucom.F90	sucpl0.F90
	suct0.F90	sudim1.F90	sugpprp.F90
	sugridf.F90	sumcc.F90	sumpini.F90
	sunud.F90	suphyds.F90	
arp/utility	deallo.F90	updtim.F90	

**Doc:**

*1/ Correction of a bug in tangent linear when simplified convection is activated.*

*Modified routine : cpphinp.F90*

*Impact : Configuration 501 now works with simplified convection. No impact in other configurations*

*2 / No read of GFL in coupling files when NCOUPLING /=1 even if NREQIN=1*

*Modified routine : sugridua.F90*

*Impact : It is now possible to read GFL in initial file and not in coupling files. This is the case in the ALADIN 3DVAR double suite*

*3/ Correction of a bug in the DFI. GFL were shifted in time after digital filter initialisation (3 hours in the screening and traj of second update of the 4DVAR)*

*Modified routine : edfi3.F90*

*New routine (to put in dfi) : edigp.F90*

*Impact : Weak but not completely evaluated (good of course it was a bug !)*

4/ Correction of a bug to run a 4DVAR when LSPRT=.TRUE. necessary when Qv is grid point (Problem in the dfi and also in canari)

Modified routines : edfi2.F90 sudim1.F90 suct0.F90

Impact : No impact when LSPRT=.FALSE.

**Project:** ifs  
**ClearCase branch:** mrpa648\_CY30T1\_b262

Added:

arp/dfi edigp.F90

Modified:

arp/adiabcpphinp.F90  
arp/dfi edfi2.F90 edfi3.F90 edigp.F90  
arp/setupstuct0.F90 sudim1.F90 sugridua.F90

**Doc:**

1/ Problem in incremental DFI : The problem is a non initialisation of the variable RMESQQ in sutoph. This variable is used in ACDRME and cause sometimes a mysterious explosion.

modified routines :

sutoph.F90  
yomtoph.F90

2/ Problem of precision in 501 401 : The problem is due to a modification of the TL/AD code of some adiab routines for stability reason using grid point q in congrad. Solution is to protect the old code by a new switch LDRY\_ECMWF .

modified routines :

cpglagtl.F90	gp_model.F90	gprtad.F90	namdyn.h	swap73.F90
cnt3.F90	ctvtotad.F90	gp_model_ad.F90	gprttl.F90	yomdyn.F90
cpdynad.F90	ctvtottl.F90	gp_model_tl.F90	lassiead.F90	slcomm2a.F90
cpdyntl.F90	dealctv.F90	gprcpad.F90	lassietl.F90	suallr.F90
cpglagad.F90	dealspa.F90	gprcptl.F90	model_error.F90	sudyn.F90

3/ Modset to run 4DVAR :

Modified routines :

suinfce.F90  
aval.F90

4/ Modset to correct some problems in geometry initialisation.

Modified routines :

incl1.F90	lamflag_odb_select.F90	suegeo1.F90	sufpd.F90
yomfpg.F90			
eincli10.F90	sueframe.F90	sueoph.F90	suoph.F90

5/ Addition of a line in sudim1 which has disappeared between cy30t1 and cy30t1\_r2 .

Modified routines :

sudim1.F90

6/ Correction of a weakness in sugfl. The use of an optional argument is not correct and cause problems sometimes (using chemistry in AROME for exemple) .

Modified routines :

sugfl.F90

**Project:** ifs  
**ClearCase branch:** mrpa648\_CY30T1\_b264

Modified:

ald/c9xx	eincli1.F90	eincli10.F90	
ald/obs_preproc		lamflag_odb_select.F90	
ald/setup	suegeo1.F90	sueoph.F90	
arp/adiab	cpdynad.F90	cpdyntl.F90	cpglagad.F90
	cpglagtl.F90	ctvtotad.F90	ctvtotl.F90
	gprcpad.F90	gprcptl.F90	gpptad.F90
	gppttl.F90	lassiead.F90	lassietl.F90
arp/c9xx	aval.F90		
arp/control	cnt3.F90	gp_model.F90	gp_model_ad.F90
	gp_model_tl.F90		
arp/module	model_error.F90	yomdyn.F90	yomfpg.F90
	yomtoph.F90		
arp/namelist	namdyn.h		
arp/parallel	slcomm2a.F90		
arp/phys_dmn	sutoph.F90		
arp/setup	sudim1.F90	sudyn.F90	sueframe.F90
	sufpd.F90	sugfl.F90	suoph.F90
arp/utility	dealctv.F90	dealspa.F90	swap73.F90
arp/varsuallr.F90		suinfce.F90	

**Doc:**

Bugfixes.

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**Project:** ifs  
**ClearCase branch:** mrpa648\_CY30T1\_none

Modified:

arp/phys\_ecsuphec.F90

## **Bernard CHAPNIK**

**Doc:**

1/ Phasing of ALADIN routines relative to the Jb with the modifications introduced by Mike Fischer in cycle CY30R1, to end with the automatization of Jb arrays. Each variable in Jb is identified by a grib code, the relative informations are found in variable SPJB\_VARS\_INFO (type defined in YOMJG).

2/ Another minor modification brings back the setup of SPA1JB (spectral 1D-fields of control variable) with associated pointers SPUBJB & SPVJB, and also the definition (YOMSPJB) and the setup (SUALSPAJB) of arrays SPSPDJB & SPSPVJB used in NH (LNHDYN=.TRUE.). This last operation requires the definition of two new grib codes (YOMGRB) .

3/ Miscellaneous phasing for cycle CY31 .

**Project:** aladin, ifs  
**ClearCase branch:** mrpa658\_CY30T1\_narbejb2

*Modified:*

ald/parallel	egathereigmd.F90		
ald/transform		etransdir_jb.F90	etransdir_jbad.F90
	etransinv_jbad.F90		etransinv_jb.F90
ald/varebalvert.F90		eбалvertad.F90	eбалverti.F90
	eбалvertiad.F90	ecosjr.F90	ejgalfa.F90
	ejghcor.F90	ejghcori.F90	ejgnrgg.F90
	ejgnrggad.F90	ejgnrggi.F90	ejgnrggiad.F90
	ejgvcor.F90	ejgvcori.F90	escaljgs.F90
	suejbcor.F90	suejbcosu.F90	suejbstd.F90
	suescal.F90	swap37.F90	
arp/module	yomgrb.F90	yomspjb.F90	
arp/utility	sualspajb.F90		
arp/varcvargpad.F90		cvargptl.F90	jgcor.F90
	jgcorad.F90	jgcori.F90	jgcoriad.F90
	jgvcor.F90		

**Doc:**

*Remove obsolete routines.*

**Project:** aladin  
**ClearCase branch:** mrpa658\_CY30T1\_none

*Deleted:*

ald/varejgvcor.F90	ejgvcori.F90
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## **DESROZIERS Gerald**

**Doc:**

*Modifications to make possible the diagnosis and filtering of background errors in observation space and their use in the screening.*

**Project:** ifs  
**ClearCase branch:** mrpm611\_CY30T1\_bgobs

*Modified:*

arp/namelist	namvar.h	
arp/obs_preproc		defrun.F90 fgchk.F90
arp/pp_obs	bgobs.F90	
arp/setup	susc2b.F90	
arp/varfltbgerr.F90		vec2gp.F90

## **GCO**

### **Doc:**

1/ Modifications for LINUX portability .

2/ Modset from Andrey Bogatchev :

ald/adiab/elarmes.F90 - redirect messages to NULERR  
ald/adiab/espectr.F90 - revised GPRCP  
ald/c9xx/ecoptra.F90 - SP7A1 now in YOMSPJB  
ald/inidata/elsirf.F90 - modified call to SUSPEC  
ald/utility/sp3to7.F90 - SP7 arrays in YOMSPJB  
arp/var/sp7to3.F90 - SP7 arrays in YOMSPJB

3/ Modset from Oldrich Spaniel :

ald/parallel/egatherspa.F90 - formal phasing CY31, but this subroutine is not used  
ald/parallel/eslextpol.F90 - phasing CY31  
ald/parallel/eslextpol1.F90 - phasing CY31  
ald/pp\_obs/sufpmove.F90 - phasing CY31 (CALL SUSPECA)  
arp/adiab/call\_sl.F90 - phasing CY31 (CALL ESLEXTPOL)  
arp/control/scan2mdm.F90 - phasing CY31 (CALL ESLEXTPOL1)

Correction of bug:

arp/parallel/gatherspa.F90 - correction of bug  
WRITE (NULERR,\*) 'SIZE(PGSPA3,3)=' ,IS3D,  
WRITE (NULERR,\*) 'SIZE(PGSPA2,2)=' ,IS2D,

4/ Modset from Rafiq Hamdi :

- \* Add LDIM1\_IS\_FLD in arguments list of egath\_spec.F90 .
- \* Add calls to GSTATS in edist\_spec\_control\_mod.F90 .
- \* Add and abort in the case LLCFIL=.TRUE. in etransinhv.F90 (configuration not supported).

**Project:** aladin, ifs, mpa, mse, odb, trans\_ald, utilities, ifsaux  
**ClearCase branch:** marp001\_CY30T1\_R2

Modified:

ald/adiab	elarmes.F90	espectr.F90	
ald/c9xx	ecoptra.F90		
ald/inidata	elsirf.F90		
ald/parallel	egatherspa.F90	eslextpol.F90	eslextpol1.F90
ald/pp_obs	sufpmove.F90		
ald/transform	etraninhv.F90		
ald/utility	sp3to7.F90		
arp/adiab	call_sl.F90		
arp/control	scan2mdm.F90		
arp/parallel	gatherspa.F90		
arp/setup	sucfu.F90	suxfu.F90	
arp/varsp7to3.F90			
mpa/chem/internals		isocom.F	
mse/internals	ver_interp_lin1d_surf.mnh	ver_interp_lin2d_surf.mnh	
odb/lib Dummies.c			
tal/external	egath_spec.F90		
tal/interface	egath_spec.h		

tal/module	edist_spec_control_mod.F90	
egath_spec_control_mod.F90		
uti/fcq man_fcq_bdm_fus.F90		
uti/gobptout	prochien.F	
uti/prescat/qretrieve		fft99.F
xrd/lanczos	startv.F	
xrd/minim	dds.F	m1qn3a.F

**Doc:**

1/ Miscellaneous changes from parallel suite: bugfixes on bad portability modifications in OULAN, and remove a bad comment in blend.F90 .

2/ Introduce conformity of IUUV fields coming from MOCAGE/GRIB codes.

3/ Add necessary radiation fields for COBEL in routine procor2.F .

**Project:** aladin, ifs, utilities  
**ClearCase branch:** marp001\_CY30T1\_op1

*Modified:*

ald/programs	blend.F90		
arp/control gp_model.F90			
uti/oulan ext_acar.F	ext_airep.F	ext_airsbt.F	
ext_atovs.F	ext_bathy.F	ext_buoy.F	
ext_ers1.F	ext_gpssol.F	ext_pilot.F	
ext_radomeh.F	ext_satem.F	ext_satgeo.F	
ext_satob.F	ext_ssmi.F	ext_ssmice.F	
ext_synop.F	ext_synor.F	ext_temp.F	
ext_tesac.F	ext_tovs.F	ext_tovsamsua.F	
ext_tovsamsub.F	ext_tovshirs.F	ext_tovshirs_ech.F	
ext_tovsmsu.F			
uti/progrid procor2.F			

**Doc:**

1/ Rename some new climate modules, and move some of them (which are not modules in fact...) to directory "arp/dia":

SIPC\_Attach.F90 to arp/dia/sipc\_attach.F90  
 SIPC\_Init\_Model.F90 to arp/dia/sipc\_init\_model.F90  
 SIPC\_Read\_Model.F90 to arp/dia/sipc\_read\_model.F90  
 SIPC\_Write\_Model.F90 to arp/dia/sipc\_write\_model.F90  
 mod\_clim.F90 to par\_clim.F90 (contains only declaration of parameters)  
 mod\_cou.F90 to par\_cou.F90 (contains only declaration of parameters)  
 mod\_sipc.F90 to par\_sipc.F90 (contains only declaration of parameters)  
 mod\_cpl.F90 to yom\_cpl.F90  
 mod\_inpc.F90 to yom\_inpc.F90  
 mod\_oas.F90 to yom\_oas.F90

2/ Update "USE ..." of those renamed modules in "updcpl.F90" and "wrcpl.F90" .

3/ Cleanings in "updnuddm.F90": remove some obsolete commented lines.

4/ Remove obsolete routine "cumcodm.F90" .

5/ Miscellaneous stuff from parallel suite: bugfixes of bad portability modifications in OULAN, and remove a bad comment in blend.F90 .



**Project:** aladin, ifs, utilities  
**ClearCase branch:** marp001\_CY30T1\_t2

*Added:*

arp/diasipc\_attach.F90      sipc\_init\_model.F90      sipc\_read\_model.F90  
    sipc\_write\_model.F90

*Renamed:*

arp/module      mod\_clim.F90 to  
arp/module/par\_clim.F90  
    mod\_cou.F90 to arp/module/par\_cou.F90  
    mod\_cpl.F90 to arp/module/yom\_cpl.F90  
    mod\_inpc.F90 to arp/module/yom\_inpc.F90  
    mod\_oas.F90 to arp/module/yom\_oas.F90  
    mod\_sipc.F90 to arp/module/par\_sipc.F90

*Deleted:*

arp/dia cumcodm.F90      pregrbphy.F90  
arp/module      SIPC\_Attach.F90      SIPC\_Init\_Model.F90  
SIPC\_Read\_Model.F90  
    SIPC\_Write\_Model.F90      iostream.F90      yoe\_uvrad.F90  
    yom\_grid\_biconserv.F90      yom\_phys\_grid.F90      yom\_reo3\_thin.F90  
    yomcoaphy.F90      yomgpsro.F90      yomrain\_lb.F90  
    yomrstbias.F90      yomsp\_ptrs.F90

*Modified:*

ald/programs      blend.F90  
arp/climate updcpl.F90      updnuddm.F90  
arp/control cnt4.F90  
arp/diasipc\_attach.F90      sipc\_init\_model.F90  
sipc\_read\_model.F90  
    sipc\_write\_model.F90  
arp/module par\_clim.F90      par\_cou.F90      par\_sipc.F90  
    yom\_cpl.F90      yom\_inpc.F90      yom\_oas.F90  
arp/ocean wrcpl.F90  
arp/setup sudim1.F90  
uti/oulan ext\_acar.F      ext\_airep.F      ext\_airsbt.F  
    ext\_atovs.F      ext\_bathy.F      ext\_buoy.F  
    ext\_ers1.F      ext\_gpssol.F      ext\_pilot.F  
    ext\_radomeh.F      ext\_satem.F      ext\_satgeo.F  
    ext\_satob.F      ext\_ssmi.F      ext\_ssmice.F  
    ext\_synop.F      ext\_synor.F      ext\_temp.F  
    ext\_tesac.F      ext\_tovs.F      ext\_tovsamsua.F  
    ext\_tovsamsub.F      ext\_tovshirs.F      ext\_tovshirs\_ech.F  
    ext\_tovsmsu.F

**HELLO Gwenaelle**

**Doc:**

*Rename some routines with suffix "\_aro", to separate AROME routines from pure Meso-NH routines .*

**Project:** mse

**ClearCase branch:** mrpe721\_CY30T1\_none

*Renamed:*

mse/internals  
mse/internals/error\_read\_aro.mnh error\_read.mnh to  
error\_write.mnh to mse/internals/error\_write\_aro.mnh  
old\_ndim.mnh to mse/internals/old\_ndim\_aro.mnh  
read\_in\_lfi\_x2.mnh to mse/internals/read\_in\_lfi\_x2\_aro.mnh  
read\_in\_lfi\_x3.mnh to mse/internals/read\_in\_lfi\_x3\_aro.mnh  
write\_in\_lfi\_x2.mnh to mse/internals/write\_in\_lfi\_x2\_aro.mnh  
write\_in\_lfi\_x3.mnh to mse/internals/write\_in\_lfi\_x3\_aro.mnh

**Doc:**

*Allow NPROMA loop together with Surfex .*

**Project:** mse  
**ClearCase branch:** mrpe721\_CY30T1\_nprom\_cl

*Added:*

mse/internals dust\_emission\_n.mnh error\_read.mnh  
error\_write.mnh  
init\_dust\_emission.mnh init\_dust\_emission\_n.mnh old\_ndim.mnh  
read\_in\_lfi\_x2.mnh read\_in\_lfi\_x3.mnh write\_in\_lfi\_x2.mnh  
write\_in\_lfi\_x3.mnh

*Deleted:*

mse/internals campaign\_water\_flux.mnh  
ch\_aer\_dep.mnh ch\_aer\_velgrav1d.mnh  
coare25\_flux.mnh diag\_misc\_teb\_n.mnh  
diag\_surf\_budget\_sea.mnh  
dst\_dep.mnh dst\_velgrav1d.mnh ice\_sea\_flux.mnh  
pack\_pgd\_soil.mnh write\_dst\_conf.mnh zoom\_pgd\_teb.mnh

*Modified:*

arp/phys\_dmn suphmnh.F90 surfext.F90  
mse/externals aro\_ground\_param.mnh aro\_surf\_diag.mnh  
aroini\_surf.mnh ini\_prep\_surfex\_aro.mnh prep\_surf\_aro.mnh  
close\_prep\_surfex\_aro.mnh  
mse/interface aroini\_surf.h  
mse/internals aroclose\_namelist.mnh aroclose\_write\_cover\_tex.mnh  
aroend\_io\_surf\_n.mnh  
aroget\_desfm\_n.mnh aroget\_luout.mnh aroget\_size\_full\_n.mnh  
aroinit\_io\_surf\_n.mnh aroopen\_namelist.mnh  
aroopen\_write\_cover\_tex.mnh  
error\_read.mnh error\_write.mnh fmatrr\_aro.mnh  
old\_ndim.mnh read\_in\_lfi\_x2.mnh read\_in\_lfi\_x3.mnh  
read\_surfc0\_aro.mnh read\_surfl0\_aro.mnh read\_surfl1\_aro.mnh  
read\_surfn0\_aro.mnh read\_surfn1\_aro.mnh read\_surft0\_aro.mnh  
read\_surfx1\_aro.mnh read\_surfx2\_aro.mnh  
write\_cover\_tex\_end.mnh  
write\_in\_lfi\_x2.mnh write\_in\_lfi\_x3.mnh write\_surfc0\_aro.mnh  
write\_surfl0\_aro.mnh write\_surfl1\_aro.mnh write\_surfn0\_aro.mnh  
write\_surfn1\_aro.mnh write\_surft0\_aro.mnh write\_surfx1\_aro.mnh  
write\_surfx2\_aro.mnh

mse/module modd\_aro\_ini\_surf.mnh modd\_io\_surf\_aro.mnh

## **Karim YESSAD**

### **Doc:**

*A bug has been identified in CNT4, only active when NSITER>0 and when a diagnostic is present at the last timestep requiring to enter in CPG. This bug may be activated in AROMLE tests if CFU, XFU, or DDH are active.*

*The reset of NCURRENT\_ITER to 0 for the last timestep predictor (JSTEP=NSTOP) was missing in CNT4 .*

*STRETCHEDNH: modifications (mainly in the semi-implicit scheme and the horizontal diffusion scheme) to use the ARPEGE NH model with stretched geometry.*

*MISC : miscellaneous minor modifications:*

- default value for SITRA.*
- SI: when B has non-real eigenvalues, print the corresponding eigenvectors.*
- SUDIM2: 'ABOR1' replaced by 'WARNING' when using a non-quadratic Gaussian grid with an Eulerian scheme.*
- default value of LREPHD set to .F. for consistency with the oper suite cy29t2\_op2.*

*Influence on the results:*

*Changing the default value of LREPHD slightly changes the results for all configurations using horizontal diffusion.*

*For comparison with the oper suite cy29t2\_op2, let LREPHD to F (new default).*

*For comparison with the old validation references, reset LREPHD=T in NAMDYN (the strategy of validation for MITRAILLETTE and most ARPEGE scripts for CY30T2+CY30R2 and CY31 will be done with LREPHD=T, then new references will be built on CY31 with LREPHD=F and if possible also the new physics, after the CY31 will be completed and validated).*

**Project:** ifs

**ClearCase branch:** mrpm603\_CY30T1\_dev30t1pour31

*Added:*

arp/setupsunhheg.F90

*Deleted:*

arp/setupsucom.F90sucpl0.F90

*Modified:*

arp/adiab spchor.F90 spnhsi.F90

arp/control cnt4.F90

arp/module yomdyn.F90

arp/setup sualdynb.F90 sudim2.F90 sudyn.F90

suhdu.F90 sunhheg.F90 sunhsi.F90

susi.F90

arp/utility deallo.F90

**Doc:**

1/ Set default for YQ\_NL%LQM to .TRUE. instead of .FALSE. .

2/ Miscellaneous bugfixes.

**Project:** ifs  
**ClearCase branch:** mrpm603\_CY30T1\_none

*Modified:*

arp/adiab	cpg_dia.F90	gprcptl.F90		
arp/diapreg	benc.F90	sumddh.F90		
arp/module		traj_main.F90	trajectory.F90	yomsp.F90
arp/parallel		trmtos.F90	trstom.F90	
arp/setup	sudim1.F90	sugfl.F90	sunud.F90	
	suspec.F90	suspeca.F90		
arp/utility	jbtomodel.F90		jbtomodelad.F90	
arp/varsujb.F90		sujr.F90		

## **Radmila BROZKOVA**

**Doc:**

*AVARC is one of the methods to construct new reference synoptic trajectory (TSR). It consists in assimilation of several reference model states, using the 4DVAR algorithmic tool. One configuration of AVARC should become operational in 2006. For this purpose all the necessary code modifications should be integrated in the reference ARPEGE library; the present modifications set is the last one to achieve this goal.*

**Project:** ifs  
**ClearCase branch:** mrpe684\_CY30\_avacy30

*Added:*

arp/sinvect	lcnoravar.F90
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*Modified:*

arp/control	cprep1.F90	scan2mtl.F90
arp/module	yomhcp.F90	
arp/namelist		namhcp.h
arp/setup	suhcp.F90	
arp/sinvect	lcnoravar.F90	
arp/varavarct.F90		

## **SEITY Yann**

**Doc:**

1/ Bugfixes for AROME .

2/ Bugfixes for the case NFPCLI=1 in fpcorphy.F90 .

**Project:** ifs, arp, mse  
**ClearCase branch:** mrpm637\_CY30T1\_bfyann

*Added:*

mpa/chem/interface                    ch\_aer\_init.h            ch\_aer\_mod\_init.h  
mpa/chem/internals                    ch\_inter1.F            ch\_inter2.F            sedim\_dust.mnh

*Modified:*

arp/phys\_dmn            apl\_arome.F90            suphmnh.F90            surfext.F90  
arp/pp\_obs            fpcorphy.F90  
mpa/chem/externals                    aro\_mnhc.mnh            aro\_mnhdust.mnh  
aroini\_mnhc.mnh                    aroini\_nsv0.mnh            ch\_aer\_init.mnh  
                  aroini\_nsv.mnh  
                  ch\_aer\_mod\_init.mnh  
mpa/chem/interface                    aro\_mnhdust.h            aroini\_mnhc.h  
aroini\_nsv0.h                    ch\_aer\_mod\_init.h  
mpa/chem/externals                    ch\_aer\_init\_soa.mnh            ch\_aer\_mineral.mnh  
ch\_aer\_trans.mnh                    ch\_inter1.F            ch\_inter2.F  
                  dust\_velgrav.mnh            jspec1.F            rdetfl.F  
                  rdno2xs.F            rdo2xs.F            rdo3xs.F  
                  rdso2xs.F            read1.F            read2.F  
                  sedim\_dust.mnh            setair.F            seto2.F  
                  settmp.F  
mpa/chem/module            modd\_ch\_aerosol.mnh            modi\_sedim\_dust.mnh  
mse/externals            aro\_ground\_param.mnh            aroini\_surf.mnh

**Doc:**

*Remove obsolete routines.*

**Project:**            ifs  
**ClearCase branch:** mrpm637\_CY30T1\_none

*Deleted:*

mpa/chem/externals                    inter1.F            inter2.F  
mse/externals            dust\_emission\_n.mnh            init\_dust\_emission.mnh  
init\_dust\_emission\_n.mnh  
mse/module            modd\_surf\_dst\_n.mnh  
modi\_dust\_emission\_n.mnh

**Doc:**

*1/ Fix bugs in creation of initial files for surface.*

*2/ Phasing with Surfex 1.2, with Meso-NH chemical, and phasing of setup of GFL (work of Jure Cedilnik – autumn 2005) .*

*3/ Miscellaneous bugfixes.*

**Project:**            aladin, ifs, mpa, mse  
**ClearCase branch:** mrpm637\_CY30T1\_yann30t1pour2

*Added:*

mpa/chem/externals                    dust\_filter.mnh  
dust\_velgrav.mnh            init\_dust.mnh

mpa/chem/module	modi_dust_filter.mnh	modi_dust_velgrav.mnh
	modi_init_dust.mnh	
	modi_sedim_dust.mnh	
mse/internals	campaign_water_flux.mnh	ch_aer_dep.mnh
ch_aer_velgrav1d.mnh	coare25_flux.mnh	diag_misc_teb_n.mnh
diag_surf_budget_sea.mnh	dst_dep.mnh	dst_velgrav1d.mnh
ice_sea_flux.mnh	pack_pgd_soil.mnh	write_dst_conf.mnh
zoom_pgd_teb.mnh		
mse/module	modd_dst_surf.mnh	mode_aer_surf.mnh
mode_coare25_psi.mnh	mode_dst_surf.mnh	modi_campaign_water_flux.mnh
	modi_ch_aer_dep.mnh	modi_coare25_flux.mnh
	modi_ch_aer_velgrav1d.mnh	
modi_diag_misc_teb_n.mnh	modi_diag_surf_budget_sea.mnh	modi_dst_dep.mnh
modi_dst_velgrav1d.mnh	modi_ice_sea_flux.mnh	modi_pack_pgd_soil.mnh
modi_write_dst_conf.mnh	modn_dst.mnh	

*Modified:*

ald/coupling	ecoupl1.F90	ecoupl1ad.F90	
ald/inidata	elswa3.F90		
ald/setup	suedyn.F90	suehdf.F90	
arp/control	scan2mad.F90	scan2mdm.F90	
scan2mtl.F90			
arp/dia wrgridua.F90			
arp/module	gfl_subs.F90	type_gfls.F90	
yomdim.F90			
	yomdyn.F90	yomdyna.F90	
arp/namelist	namct0.h	namdim.h	namdyn.h
	namdyna.h		
arp/phys_dmn	apl_arome.F90	mf_phys.F90	
suphmnh.F90			
	surfext.F90		
arp/setup	sudim1.F90	sudim2.F90	sudyn.F90
	sudyna.F90	sugridua.F90	
	sugfl.F90	suhdf.F90	
	sugridug.F90		
arp/varrdfpinc.F90			
mpa/chem/externals		aro_mnhdust.mnh	
aroini_mnhc.mnh	aroini_nsv.mnh		
	aroini_nsv0.mnh		
mpa/chem/interface		aro_mnhc.h	
aro_mnhdust.h	aroini_nsv0.h		
mpa/chem/internals		ch_interp_jvalues_n.mnh	
dust_filter.mnh	dust_velgrav.mnh		
	init_dust.mnh		
mpa/chem/module	modd_csts_dust.mnh	modd_dust.mnh	
modd_dust_opt_lkt.mnh			
	mode_dust_psd.mnh	modi_dust_filter.mnh	
modi_dust_velgrav.mnh			
	modi_init_dust.mnh	modi_sedim_dust.mnh	

mse/externals	aro_ground_param.mnh	aroini_surf.mnh
mse/internals	albedo_1d_patch.mnh	alloc_diag_surf_atm_n.mnh
av_patch_pgd.mnh		
av_patch_pgd_1d.mnh		av_pgd.mnh
av_pgd_1d.mnh		
average1_mesh.mnh		average2_mesh.mnh
average_diag.mnh		
average_diag_isba_n.mnh		average_diag_misc_isba_n.mnh
bld_e_budget.mnh		
build_emisstab_n.mnh		build_pronoslist_n.mnh
campaign_water_flux.mnh		
ch_aer_dep.mnh		ch_aer_emission.mnh
ch_aer_velgrav1d.mnh		
ch_bvocem_n.mnh		ch_dep_isba.mnh
ch_init_depcost.mnh		
ch_init_names.mnh		coare25_flux.mnh
convert_cover_isba.mnh		
convert_cover_teb.mnh		coupling_dst_n.mnh
coupling_isba_n.mnh		
coupling_seaflux_n.mnh		coupling_surf_atm_n.mnh
coupling_teb_n.mnh		
coupling_watflux_n.mnh		dealloc_diag_surf_atm_n.mnh
dealloc_isba_n.mnh		
default_diag_surf_atm.mnh		default_dst_n.mnh
default_seaflux.mnh		
diag_inland_water_n.mnh		diag_inline_isba_n.mnh
diag_inline_seaflux_n.mnh		
diag_inline_teb_n.mnh		diag_inline_watflux_n.mnh
diag_isba_init_n.mnh		
diag_isba_n.mnh		diag_misc_isba_n.mnh
diag_misc_teb_n.mnh		
diag_nature_n.mnh		diag_sea_n.mnh
diag_seaflux_init_n.mnh		
diag_seaflux_n.mnh		diag_surf_atm_n.mnh
diag_surf_budget_sea.mnh		
diag_teb_init_n.mnh		diag_teb_n.mnh
diag_town_n.mnh		
diag_watflux_init_n.mnh		dst_dep.mnh
dst_init_modes.mnh		
dst_init_names.mnh		dst_velgrav1d.mnh
dust_emission_n.mnh		
get_flux_n.mnh		goto_wrapper_surfatm.mnh
ice_sea_flux.mnh		
init_dst_n.mnh		init_from_data_isba_n.mnh
init_isba_n.mnh		
init_seaflux_n.mnh		init_surf_atm_n.mnh
init_teb_n.mnh		
init_watflux_n.mnh		pack_diag_patch_n.mnh
pack_pgd_isba.mnh		
pack_pgd_soil.mnh		pgd_frac.mnh
pgd_isba.mnh		
pgd_isba_par.mnh		pgd_orography.mnh
pgd_teb_par.mnh		
prep_isba.mnh		prep_ver_isba.mnh
put_zs_n.mnh		
read_default_dst_n.mnh		read_default_seaflux_n.mnh
read_dst_conf_n.mnh		
read_grib.mnh		read_isba_conf_n.mnh
read_seaflux_conf_n.mnh		

read_surfx1_aro.mnh	read_surfx2_aro.mnh
unpack_diag_patch_n.mnh	
write_cover_tex_end.mnh	write_diag_misc_isba_n.mnh
write_diag_misc_teb_n.mnh	
write_diag_pgd_isba_n.mnh	write_diag_seb_isba_n.mnh
write_diag_seb_seaflux_n.mnh	
write_diag_seb_surf_atm_n.mnh	write_diag_seb_teb_n.mnh
write_diag_seb_watflux_n.mnh	
write_dst_conf.mnh	write_surf_atm_n.mnh
writesurf_atm_conf_n.mnh	
writesurf_isba_conf_n.mnh	zoom_pgd_cover.mnh
zoom_pgd_isba.mnh	
zoom_pgd_isba_full.mnh	zoom_pgd_nature.mnh
zoom_pgd_orography.mnh	
zoom_pgd_surf_atm.mnh	zoom_pgd_teb.mnh
zoom_pgd_town.mnh	
mse/module	modd_ch_seaflux_n.mnh
modd_ch_isba_n.mnh	
modd_ch_teb_n.mnh	
modd_ch_watflux_n.mnh	modd_chs_aerosol.mnh
modd_data_cover_par.mnh	
modd_diag_isba_n.mnh	modd_diag_misc_isba_n.mnh
modd_diag_misc_teb_n.mnh	
modd_diag_seaflux_n.mnh	modd_diag_surf_atm_n.mnh
modd_diag_teb_n.mnh	
modd_diag_watflux_n.mnh	modd_dst_n.mnh
modd_dst_surf.mnh	
modd_pack_diag_isba.mnh	modd_pgdwork.mnh
modd_seaflux_n.mnh	
mode_aer_surf.mnh	mode_coare25_psi.mnh
mode_dst_surf.mnh	
mode_dstmbl.mnh	mode_dstmblutl.mnh
mode_thermos.mnh	
modi_average_diag.mnh	modi_campaign_water_flux.mnh
modi_ch_aer_dep.mnh	
modi_ch_aer_emission.mnh	modi_ch_aer_velgrav1d.mnh
modi_ch_init_names.mnh	
modi_coare25_flux.mnh	modi_default_diag_surf_atm.mnh
modi_default_dst_n.mnh	
modi_default_seaflux.mnh	modi_diag_inland_water_n.mnh
modi_diag_inline_seaflux_n.mnh	
modi_diag_inline_teb_n.mnh	modi_diag_isba_n.mnh
modi_diag_misc_teb_n.mnh	
modi_diag_nature_n.mnh	modi_diag_sea_n.mnh
modi_diag_seaflux_n.mnh	
modi_diag_surf_budget_sea.mnh	modi_diag_teb_n.mnh
modi_diag_town_n.mnh	
modi_dst_dep.mnh	modi_dst_init_modes.mnh
modi_dst_init_names.mnh	
modi_dst_velgrav1d.mnh	modi_ice_sea_flux.mnh
modi_pack_pgd_isba.mnh	
modi_pack_pgd_soil.mnh	modi_read_default_dst_n.mnh
modi_read_dst_conf_n.mnh	
modi_write_dst_conf.mnh	modi_zoom_pgd_cover.mnh
modn_chs_orilam.mnh	
modn_dst.mnh	modn_isba_n.mnh
modn_seaflux_n.mnh	
modn_surf_atm_n.mnh	modn_teb_n.mnh
modn_watflux_n.mnh	



## **SPANIEL Oida**

### **Doc:**

1) added routine:

- arp/phys\_dmn/ac\_cloud\_model.F90  
Cloud optical coefficients with ice/water content and non-local saturation effect.

2) modified routines:

-arp/control/gp\_model.F90  
Set T1 arrays to zero for security when ALADIN (extension zone).

-arp/control/gp\_model\_ad.F90  
Set T1 arrays to zero for security when ALADIN (extension zone).

-arp/control/gp\_model\_tl.F90  
Set T1 arrays to zero for security when ALADIN (extension zone).

-arp/module/yomphy.F90  
Introduction of two new keys:  
: LPRGML to activate new mixing length computation common for momentum and heat;  
: LCLSATUR to activate new computation of cloud optical coefficients.

-arp/module/yomphy0.F90  
Introduction of tuning constants for mixing lengths and for Charnock formulae.

-arp/module/yomphy3.F90  
Introduction of constants for new cloud model.

-arp/namelist/namphy.h  
Introduction of two new keys:  
: LPRGML to activate new mixing length computation common for momentum and heat;  
: LCLSATUR to activate new computation of cloud optical coefficients.

-arp/namelist/namphy0.h  
Introduction of tuning constants for mixing lengths and for Charnock formulae.

-arp/namelist/namphy3.h  
Introduction of constants for new cloud model.

-arp/phys/acclph.F90  
Improvements of the Ayotte method by Martina Tudor. Further correction to make it compatible with Troen-Mahrt method.

-arp/phys\_dmn/accoefk.F90  
Interface to aplpar: neutral exchange coefficient and PTKF antifib. coeff. Bug correction in ACCOEFK which is part of the modset. The computation of the moist gustiness should never have been sandwiched between the two parts of the XDAMP antifibrillation-like computation.

-arp/phys\_dmn/acdifus.F90  
Preparation for thermal roughness term over sea (PGZ0HF)

*-arp/phys\_dmn/acdrag.F90  
Improvement of new scheme (LNEWD)*

*-arp/phys\_dmn/acmixlenz.F90  
Introduction of joint computation of mixing lengths for momentum and heat.*

*-arp/phys\_dmn/acraneb.F90  
Introduction of new cloud model.*

*-arp/phys\_dmn/aplpar.F90  
Correction of the bug in the calling sequence for the  
CGMIXLEN='AY' option.  
Interface to accoeffk and acraneb.*

*-arp/phys\_dmn/suphy0.F90  
Defaults and print of tuning constants for mixing lengths and for Charnock  
formulae.*

*-arp/phys\_dmn/suphy3.F90  
Defaults and prints of tuning constants for new cloud model.*

*-arp/setup/su0phy.F90  
Defaults and prints of new logical keys.*

*-arp/phys\_dmn/acpluie.F90  
Correction of the bug in computing ZEVA, ZFON.  
(there is a square root around brackets where REVGSL is used)  
The fix requires REVGSL=15 in namelist (the usage of REVGSL=4. is only an  
approximative remedy for those having bugged ACPLUIE).*

*Tests done so far:*

*=====*

*ARPEGE forecast up to 6h:*

- reference run with operational library and namelist.*
  - test run with updated library and operational namelist.*
- GPNORMS of physical fluxes are bit identical after 6h.*

*ALADIN forecast up to 48h(ALADIN FRANCE operational):*

*test for oper namelist from mitraille (chainjob\_018 AG1T = nam001\_newfr\_oper\_29t2)*

*- binary GOUROUBIN='al29t2\_op2.06.L0209.x.exe' = corresponding with cy29t2\_op2.13*

*- binary MYOWNBIN='~mrpe693/pack/al29\_t2/bin/ALADIN' = cy29t2\_op2.13 + 20 routines  
except*

*arp/phys\_dmn/acpluie.F90 that should be used as general bugfix for all later  
cycles*

*GPNORMS of physical fluxes are bit identical after 48h.*

*Additional notes:*

*=====*

- the modset should have official name "pre-ALARO\_0\_modset"*
- the routine acpluie.F90 should be use in all higher cycles*
- scientific documentation will be prepared later*
- the ClearCase view arp\_mrpe693\_CY29T2\_alfix and arp\_mrpe693\_CY30T1\_alfix are public.*

**Project:** ifs  
**ClearCase branch:** mrpe693\_CY30T1\_alfix31

*Added:*

arp/phys\_dmn ac\_cloud\_model.F90

*Deleted:*

arp/phys\_dmn acdnshf.F90

*Modified:*

arp/control	gp_model.F90	gp_model_ad.F90	gp_model_tl.F90
arp/module	yomphy.F90	yomphy0.F90	yomphy3.F90
arp/namelist	namphy.h	namphy0.h	namphy3.h
arp/phys_dmn	ac_cloud_model.F90	ac_cloud_model.F90	acclph.F90
	acdifus.F90	acdrag.F90	acmixlenz.F90
	acpluie.F90	acraneb.F90	aplpar.F90
	suphy0.F90	suphy3.F90	
arp/setup	su0phy.F90		accoefk.F90